

Bellwork: 12/16/11

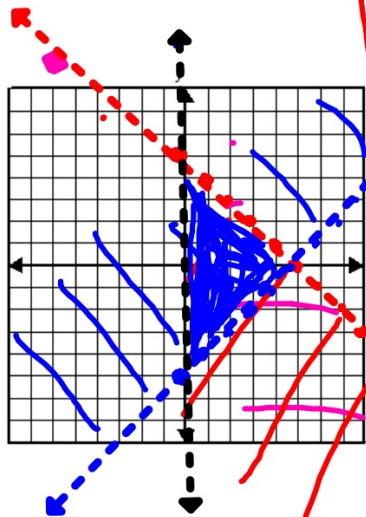
Graph:

$$x > 0$$

$$y < -x + 5$$

$$y + 5 > x$$

$$y > x - 5$$



ANY METHOD:

$$\boxed{(-1, 9)}$$

$$2x + 5y = 43$$

$$5(7x - y) = (-16)5$$

$$2x + 5y = 43$$

$$35x - 5y = -80$$

$$37x = -37$$

$$\boxed{x = -1}$$

$$7(-1) - y = -16$$

$$-7 - y = -16$$

$$-y = -9$$

$$\boxed{y = 9}$$

Solve the following systems using any method you choose:

$$1) \begin{cases} 3x + 3y = 4 \\ 3x + 4y = 7 \end{cases}$$

$$\begin{array}{r} 6x + 9y = 12 \\ -6x + 8y = -14 \end{array}$$

$$\frac{17y}{17} = \frac{-2}{17}$$

$$y = -\frac{2}{17}$$

$$\left(\frac{37}{17}, -\frac{2}{17}\right)$$

$$2x + 3\left(-\frac{2}{17}\right) = 4$$

$$\star 2x - \frac{6}{17} = 4 \quad 17(2x - \frac{6}{17} = 4)$$

$$+ \frac{6}{17} + \frac{6}{17}$$

$$2x = 4 \frac{6}{17}$$

$$2x = \frac{74}{17}$$

$$x = \frac{37}{17}$$

Solve the following systems using any method you choose:

$$(-6, -6)$$

$$2) \begin{cases} x + y = -12 \\ 2x - 3y = 6 \end{cases} ; \boxed{x = -y - 12}$$

$$2(-y - 12) - 3y = 6$$

$$-2y - 24 - 3y = 6$$

$$-5y - 24 = 6$$

$$-5y = 30$$

$$\boxed{y = -6}$$

$$x - 6 = -12$$

$$x = -6$$

Solve the following systems using any method you choose:

$$3) \begin{cases} 5x - 2y = 3 \\ 2x - y = 0 \end{cases}$$

Solve the following systems using any method you choose:

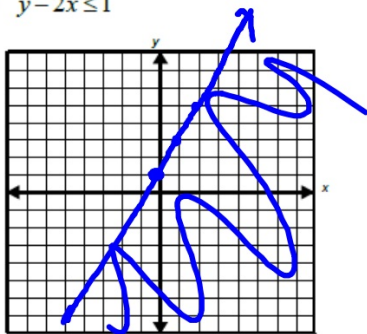
$$4) \begin{cases} 5x - 7y = 2 & ; \quad \overset{4}{(5x - 7y = 2)} \\ 3x = 4y & ; \quad \underline{\overset{-7}{(3x - 4y = 0)}} \end{cases}$$

$$\begin{array}{r} 20x - \cancel{28y} = 8 \\ -21x + \cancel{28y} = 0 \\ \hline -x = 8 \\ \boxed{x = -8} \end{array}$$

$$\begin{aligned} 3(-8) &= 4y \\ -24 &= 4y \\ -6 &= y \end{aligned}$$

Graph the following inequalities:

5) $y - 2x \leq 1$

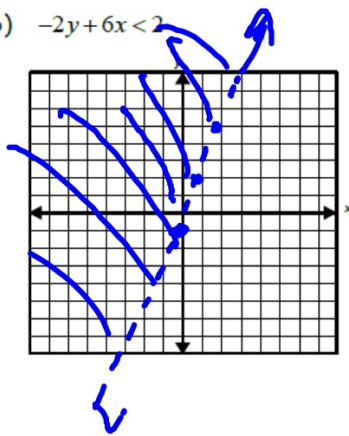


$$y - 2x \leq 1$$

$$y \leq 2x + 1$$

Graph the following inequalities:

6) $-2y + 6x < 2$



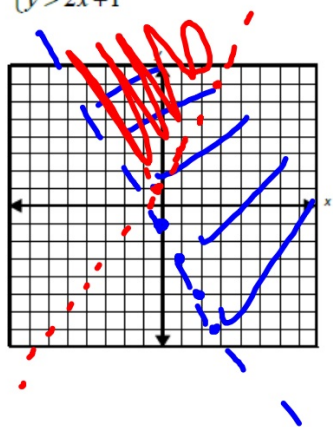
$$-2y + 6x < 2$$

$$-2y < -6x + 2$$

$$y > 3x - 1$$

Graph the following systems of inequalities: (Be sure to shade your final region very dark!!)

7)
$$\begin{cases} -2y < 4x + 2 \\ y > 2x + 1 \end{cases}$$



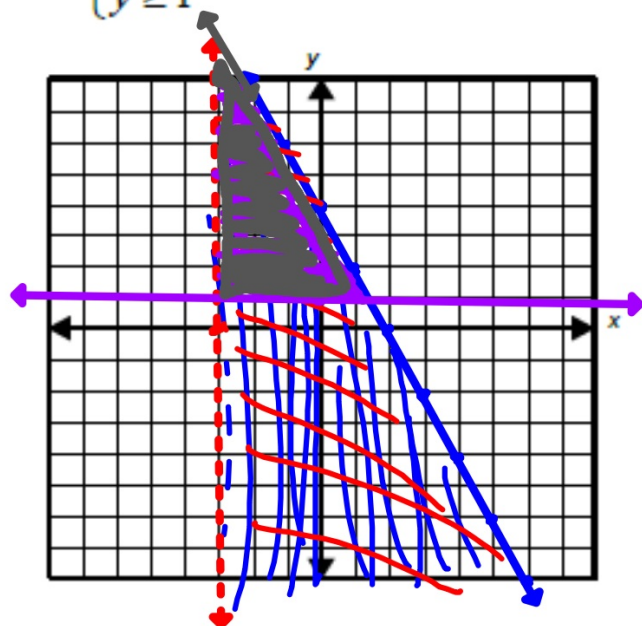
$$-2y < 4x + 2$$

$$y > -2x - 1$$

$$y > 2x + 1$$

Graph the following systems of inequalities: (Be sure to shade your final region very dark!!)

$$8) \begin{cases} y \leq -2x + 4 \\ x > -3 \\ y \geq 1 \end{cases}$$



Cumulative Questions:

9) Find the equation of the line through the points $(-4, 7)$ and $(-5, 2)$.

$$\frac{2-7}{-5-(-4)}$$

$$y - y_1 = m(x - x_1)$$

$$\frac{-5}{-1} = 5$$

$$y - 7 = 5(x + 4)$$

$$y - 7 = 5x + 20$$

$$y = 5x + 27$$

$$y - y_1 = m(x - x_1)$$

Perform the following operations given $f(x) = x^2 + 4$ and $g(x) = 2x - 6$.

10) $f(x) - g(x) =$

$$(x^2 + 4) - (2x - 6)$$

$$(x^2 + 4) - 1(2x - 6)$$

$$x^2 + \underline{4} - 2x + \underline{6}$$

$$x^2 - 2x + 10$$

11) $(f \cdot g)(x) =$

$$(x^2 + 4)(2x - 6)$$

$$2x^3 - 6x^2 + 8x - 24$$

Perform the following operations given $f(x) = x^2 + 4$ and $g(x) = 2x - 6$.

12) $f(g(x)) =$

13) Find the inverse of $g(x)$.

$f(g(x))$
 $f(2x-6)$
 $(2x-6)^2 + 4$
 $\star (2x-6)(2x-6) + 4$
 $4x^2 - 12x - 12x + 36 + 4$
 $4x^2 - 24x + 40$

① Replace $f(x)$ or $g(x)$ with y
 ② Switch x and y
 ③ Solve for y
 ④ Replace y with $g^{-1}(x)$

$g(x) = 2x - 6$
 $y = 2x - 6$
 $x = 2y - 6$
 $x + 6 = 2y$
 $\frac{x}{2} + 3 = y$
 $g^{-1}(x) = \frac{x}{2} + 3$

Solve the following linear programming problem (Use your graph provided, and make sure your answer is a **complete sentence**.)

14) A biologist needs at least 50 rodents for an experiment. She cannot use more than 20 mice or more than 35 rats. Each mouse costs \$5.00 and each rat costs \$3.00. How many of each rodent should she use in order to minimize the cost?

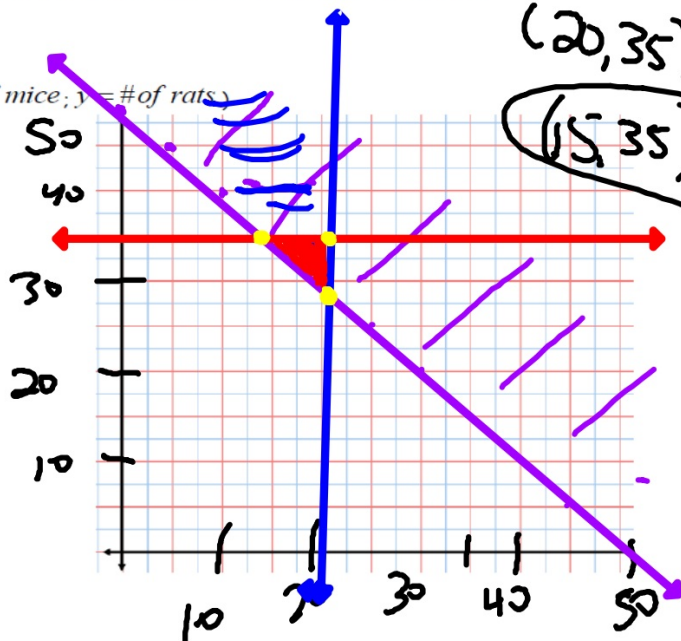
Constraints: (x = # of mice; y = # of rats)

$$x + y \geq 50$$

$$x \leq 20$$

$$y \leq 35$$

$$y \geq -x + 50$$



$$C = 5x + 3y$$

$$(20, 30) = 5(20) + 3(30)$$

$$(20, 35) = 5(20) + 3(35)$$

$$(15, 35) = 5(15) + 3(35)$$

Answer:

To minimize cost you should buy 15 mice and 35 rats.